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ABSTRACT

Five case studies illustrate evacuation decision making in a wilderness setting. The cases describe medical problems encountered during wilderness trips: (1) a hiker suffering from hypothermia; (2) a 49-year-old man with chest pains; (3) a 19-year-old woman with abdominal pain; (4) a young woman in anaphylactic shock; and (5) a teenager hit on the back of the head. In each case, the situation and facts are outlined, including the patient's vital signs, and at several points in the case's progression, the outdoor leader is asked to make an assessment and outline a plan and anticipated problems. Each case is followed by a debriefing that discusses the important points in the presenting problem and the signs that would call for immediate evacuation of the patient. (SAS)

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CASE STUDIES IN WILDERNESS MEDICINE, THE SEQUEL

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ABSTRACT

This workshop will explore current issues in wilderness medicine through the use of case studies. Emphasis will be placed on evacuation decision making. This will be an excellent refresher for anyone with wilderness medicine training and invaluable for program administrators responsible for developing evacuation protocols. For Case Studies 1-5 please refer to the 1996 ICORE Conference Proceedings.

CASE STUDY 6

You are guiding your clients on a winter ascent in the Tetons. It is the first clear day in nearly a week and the temperature has finally topped the 0°F (0°C) mark. As you stop for a break at 9 A.M., 4 miles into your climb, one of your clients notices a figure in the distance huddled next to a large rock. You go over to investigate and recognize the outer wear of one of the climbers you met yesterday as he began his ascent of the peak.

You approach the man to see if he is OK and to offer your help. He makes no movement or sound as you walk over to him. You notice that his face and beard are crusted with ice and his face is extremely pale. His eyes are closed. You attempt to wake him up by shouting at him and, when you get no response, by vigorously rubbing your knuckles across his sternum. You think you detect a faint moan. You begin an initial assessment of the man looking for airway, breathing and circulation. You find no evidence of trauma on your head-to-toe exam. At 9:10 A.M. his vital signs are:

LOC: Unresponsive, except for the faint moan
HR: No detectable pulse
RR: 4, almost undetectable
SCTM: Pale/Cold/Dry
BP: No detectable radial pulse
P: Extremely slow to respond to light

Please list your current assessment, plan, and anticipated problems.

DEBRIEF POINTS CASE STUDY 6

It is important to understand the implications of and guidelines for the performance of Cardiopulmonary Resuscitation (CPR) in the wilderness. In an urban context CPR should not be initiated if there is: Any sign of life in the patient, a danger to the rescuers, dependent lividity (a

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pooling of blood in the lowest parts of the body), rigor mortis (a stiffening of the limbs), an obvious lethal injury (e.g., decapitation), or a well defined Do Not Resuscitate (DNR) status.

In addition to the urban guidelines, there is an additional guideline that applies in a wilderness context. If the patient is rigid from the cold and has a non-compressible chest, chest compressions should not be initiated. It is virtually impossible to determine the presence or absence of cardiac electrical activity in a cold, rigid patient without a portable EKG machine. It is however very possible for a person to succumb to exposure hypothermia, have no detectable breathing or palpable pulse, and still be alive, but very fragile. In spite of the apparent absence of breathing or a pulse, many of these patients will exhibit some sign of life such as a deep pain response, pupil response, fluttering eyelids, etc.

The most appropriate treatment for a cold, rigid, pulseless patient in the wilderness is to: Begin artificial respirations, preferably with supplemental oxygen, to package them to prevent further heat loss, and to evacuate them as gently and quickly as possible.

CASE STUDY 7

You are leading a 2 week hiking and natural history program in the Grand Gulch area of Utah. It is the fifth day of the trip and you have decided to hike up to the canyon rim via a steep side canyon. You reach the plateau behind most of your students and glance back to see Jim Doe, your oldest student at the age of 49, sitting on a rock with his hands braced on his knees about 100 feet below you. You call down to him to see if he needs help and he replies that he's not feeling too well, but probably just needs to rest a bit. You leave your other students under the care of your co-instructor and carefully make your way down to Jim.

Upon your arrival you notice that Jim looks pale in spite of the 80°F day. He is breathing rapidly and shallowly. When you inquire further you discover that as he was ascending the canyon he became suddenly short of breath and began to experience a tightness in his chest. Because he also felt nauseated he assumed that the strenuous hike out of the canyon was upsetting his recent lunch. He continued to hike until the tightness in his chest worsened and he was unable to catch his breath. He reports feeling lightheaded and dizzy and says he doesn't think he will be able to continue with the hike. He denies ever feeling this way before, denies falling down and says he has no relevant medical history. At 1 P.M. his vital signs are:

LOC: Alert but anxious
HR: 96, strong and regular
RR: 28 and shallow
SCTM: Pale/Cool/Moist
BP: 162/P
P: Equal, round and reactive to light

Please list your current assessment, plan, and anticipated problems.

At 1:20 P.M. Jim reports that he now feels pain radiating down his left arm and that it feels like someone laid a huge boulder across his chest. He is becoming increasingly agitated and is worried about how he is going to get out of there. At 1:20 P.M. his vital signs are:

LOC: Alert but agitated
HR: 104, weak and regular
RR: 30 and shallow
SCTM: Pale/Cool/Moist
BP: 164/P
P: Equal, round and reactive to light

Please list your current assessment, plan, and anticipated problems.

DEBRIEF POINTS CASE STUDY 7

Cardiac emergencies are a threat to life to patients in urban settings and an even greater threat to patients in remote settings where time to definitive medical care is delayed. Management of the wilderness cardiac patient revolves around two important principles, keep the patient as calm as possible (physically and emotionally) and evacuate them as rapidly as possible. Someone exhibiting the signs and symptoms of a heart attack that do not relieve with 10-20 minutes of rest, should be evacuated with the least exertion possible. A heart attack justifies the use of a helicopter or other rapid evacuation methods. Asking the patient to walk will overwork an already overworked heart and may significantly worsen the patient's condition. While waiting for an evacuation you can consider administering one aspirin to your patient to help reduce clotting and assisting them with their own nitroglycerin medication. You may help administer up to three nitroglycerin tablets. If available, supplemental oxygen will greatly help your patient. It is important to realize that denial on the part of the patient is a significant factor that often delays the onset of care.

CASE STUDY 8

You are instructing a month long wilderness expedition in the Wind River Mountains of WY. It is the beginning of your third week and you are presently 14 miles from the nearest roadhead. This morning 19 year old Sandy Doe approaches you in tears. She says she is feeling awful. She says the last week has been a challenge for her. She says she felt great the first week of the course, but this last week she has been extremely tired and feels unable to keep up with the group. She says she has been getting nauseated when she hikes and has very little appetite. Yesterday afternoon she began to experience lower abdominal pain and cramps that persisted through this morning. She says she also noticed some vaginal spotting beginning yesterday that is continuing. She says she felt dizzy when she walked over to find you. During your conversation you notice that she appears tired and she looks quite pale. Upon physical exam she is tender in the lower quadrants of her abdomen and she appears to be guarding the area. She has no relevant medical history, states that she is sexually active, and says her last menstrual cycle was about six weeks ago. She says the trip has been very stressful for her. At 7:30 A.M. her vital signs are:

LOC: Alert, but anxious
HR: 108, weak and regular
RR: 24, unlabored
SCTM: Pale/Cool/Moist
BP: 86/P
P: Equal, round and reactive to light

Please list your current assessment, plan, and anticipated problems.

Upon reexamination at 10:30 A.M. her abdomen feels rigid and her vital signs are:

LOC: Alert and very agitated
HR: 116, weak and regular
RR: 24, unlabored
SCTM: Pale/Cool/Moist
BP: 78/P
P: Equal, round and reactive to light

Please list your current assessment, plan, and anticipated problems.

DEBRIEF POINTS CASE STUDY 8

Because it is challenging to correctly assess the severity of abdominal injuries or illnesses in the backcountry, it is recommended that you evacuate anyone with abdominal pain who also has: Signs and symptoms of shock, blood in the vomit, feces or urine, pain persisting greater than 12-24 hours, localized pain especially with guarding, tenderness or rigidity, persistent nausea and

vomiting, or diarrhea greater than 24-72 hours, fever above 102°F (38°C), or signs and symptoms of pregnancy.

In general, it is recommended that any sexually active female who presents with lower abdominal pain should be evaluated for pregnancy. If pregnancy is suspected, she should be evacuated immediately. Classic early signs and symptoms of pregnancy include: Amenorrhea, fatigue, breast tenderness, frequent urination and nausea. Potentially serious complications in the first trimester include spontaneous abortion and ruptured ectopic pregnancy.

CASE STUDY 9

It is a fine spring day, plants blooming and bees buzzing. Your group of would be naturalists are busy identifying flowers. Suddenly a scream pierces the air and you see one of your students, Kim Doe, running across the meadow engulfed in a swarm of bees, angry about the nest she has just disturbed. She runs towards the river and immerses herself to escape. By the time you reach the water most of the bees have given up and you dodge the last few angry buzzers to reach her side. She is sobbing hysterically from pain and fright. You coax her onto shore and notice at least 50 red raised welts from the stings. The next few minutes pass too quickly. Before your eyes her face begins to redden and swell. Suddenly she complains not of pain but of increasing difficulty catching her breath. Her breathing becomes ragged and gasping. You think back to her medical form and cannot recall any history of an allergy to bees. Less than five minutes after you pull her out of the water she collapses on the ground, her skin flushed and her face swollen. She appears to be barely breathing. At 2 P.M. her vital signs are:

LOC: Pain responsive
HR: 112, weak and regular
RR: 32, shallow and wheezy
SCTM: Red/Warm/Moist
BP: No radial pulse
P: Equal, round and reactive to light

Please list your current assessment, plan, and anticipated problems.

DEBRIEF POINTS CASE STUDY 9

Your student has suffered from a life threatening form of allergic reaction known as anaphylaxis. Her body has mounted an all out attack against the foreign protein introduced into her system by the bee venom. In this case, however, her body has overreacted causing an excessive release of histamines which result in a widening of her blood vessels and a narrowing of her air passages. The end result, death by shock and suffocation.

In order to control and eventually reverse this reaction it is imperative that she receive injectable epinephrine followed by oral antihistamines. In a patient with acute anaphylaxis, death is almost certain without these medications. Injectable epinephrine is available by prescription in three forms in the United States: the Ana-Kit ® (Holister-Stier), the Ana-Guard ® (Holister-Stier), and the EpiPen ® (Center Labs). Each of these forms comes ready to administer with pre-loaded adult doses. The Ana-Kit ® and Ana-Guard ® have the advantage of having two pre-loaded doses in one syringe. The disadvantage is the user must be comfortable actually administering a shot into the patient's shoulder or thigh muscles. The EpiPen ® comes with only one pre-loaded dose, however it has an auto-inject mechanism making it simple for the patient to self administer. Center Labs also makes an EpiPen Jr. ® for children under 12. Oral antihistamines are available over the counter in many forms, the most common and typically the most effective is Benadryl ® (diphenhydramine). Oral antihistamines should be administered until the patient reaches definitive medical care.

Note: Whenever administering medications, especially prescription medications, it is critical that they be administered under the direction of a physician's written or verbal orders. If you choose to

carry medications for your outdoor program, you should have a physician preceptor to help establish protocols for their administration and to provide continued training for your staff.

CASE STUDY 10

You and your assistant instructor are leading a group of 12, 14 and 15 year olds in the Absaroka Mountains, WY. You are on the 5th day of a seven day trip and are 8 miles from the closest trailhead. The students are setting up the bear hang for the evening. It is 8:30 P.M.

The muffled curse in the distance is followed the arrival of one of your students informing you that 14 year old Charlie Doe has been hit in the back of the head by the rock the students were using to get the rope over the branch. The student says that Charlie fell forward after the rock hit his unhelmeted head and they had to "shout at him a couple of times" before he moaned back at them.

When you arrive, approximately five minutes after the incident occurred, you find Charlie propped up against a tree holding his head. There is blood on his hands and matted in the hair on the back of his head. Your complete assessment reveals no significant injuries except the now clotted laceration on the back of Charlie's head and no evidence of spinal injury. Charlie is complaining of dizziness and a headache. He admits to feeling slightly nauseous and wants to go to bed. He says he cannot remember if he lost consciousness or not. At 8:50 P.M. his vital signs are:

LOC: Awake and oriented
HR: 76 regular and strong
RR: 16 and easy
SCTM: Pale, warm, and moist
BP: 100/60
P: Equal, round and reactive to light

Please list your current problems, plan, and anticipated problems.

Charlie's vital signs remained stable throughout the night. He slept, but restlessly. He is ambulatory, but complaining of dizziness, nausea and a slight headache. At 7:00 A.M. his vital signs are:

LOC: Awake and oriented
HR: 64 regular and easy
RR: 12 and easy
SCTM: Pink, warm, dry
BP: 110/68
P: Equal, round and reactive to light

Please list your current problems, plan, anticipated problems.

DEBRIEF POINTS CASE STUDY 10

Head injuries often present significant challenges to outdoor trip leaders when deciding whether a student needs to be evacuated or not. A patient with a mild closed head injury may complain of dizziness, nausea, slight vision disturbances, headache, and weakness. None of these symptoms in and of themselves are necessarily cause for concern. A patient who is unconscious briefly with signs and symptoms of a mild closed head injury may be allowed to remain in the backcountry, but needs to be monitored for a worsening head injury. The conservative course of action, however, is to evacuate any individual who looses consciousness, especially minors whose parents or guardians may be upset to find out their child was unconscious 10 days ago! Patients who remain in the field should be allowed to sleep, but awakened at 2 hour intervals to check for: change in mental status, worsening headache, vision disturbances, protracted vomiting, lethargy, excessive sleepiness, ataxia or seizures. If any of these serious signs develop the patient should be evacuated from the field rapidly.